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Student's Name

Date March 1, 1971

Instructor's No.

Subject

Sea target

Trace data → 2" / density unit - scale to 1/10" on chart

Steps → 4.0 (2) | 8.0 (3) | 16.0 (4) | 32.0 (5) | 64.0 (6)

Data →

9.99 l/mm	8.98	17.96	35.92	71.84	(1)
5.08	10.16	20.32	40.64	81.27	(2)
5.699	11.90	22.80	45.59	91.18	(3)
6.390	12.78	25.56	51.12	102.2	(4)
7.127	14.25	28.51	57.02	114.0	(5)

Sub groups no.

STAT

March 10 1971

Declassification Review by NGA/DoD

Phase filters for defocusing and linear blur.

John has master phase plates for both defocusing & linear blur on film. These will be used on the Miller printer for contact prints onto 2 x 2 H.R.P. The sensitometry that Max has been doing will now be used to generate these plates.

John & I looked at the data of the density steps vs phase shift to find the proper density for a 90° phase shift.

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

STAT

Student's Name Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3 Date March 10, 1977

Subject ~~Instructor's Name~~

A 50% phase shift on the interferometer using $\lambda = 6328\text{Å}$ is a $\left(\frac{5461}{6328} \times 50\%\right) = 43\%$ using $\lambda = 5461\text{Å}$. The interferograms showed a density of about 1.6 is necessary for this 43% phase shift (6328Å), 50% (5461Å).

Using the masters Mask 4 generated 3 amplitude images of the phase plate using the following:

① Contact print on the Miller

② Exposure times 3 sec. = Using Timer on the Miller
1 min = " " " " "
1½ min. = " " " " "

③ Development as specified for controled sensitometry.

④ Measurement of density on densitometer
(a) Calibrate densitometer
(b) after calibration rezero densitometer on the A.R.T. This will subtract

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STAT

Student's Name

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

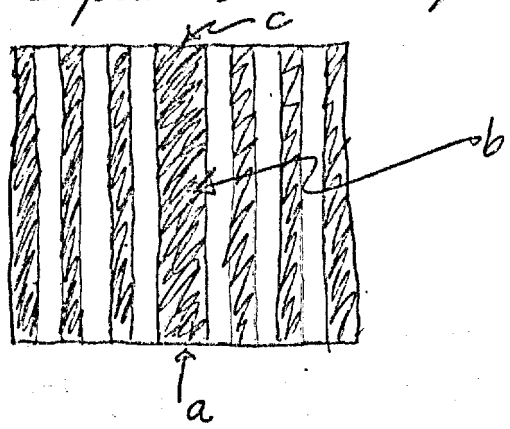
Date March 10, 1971

Subject

Instructor's Name

out the fog level of the plate.

(c) Results: The plate was as follows.



Point (a) and point (c) measured the same density value.

Point (b) measured .1 density units less than a & b.

This may be from the exposure or the development. Thus an experiment will be made to check this.

(1) Expose a complete 2×2 plate

(2) Expose a second plate overlaping half the area of plate (1).

(3) Check the density of the plate in the overlapping area and in the center.

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

STAT

Student's Name

Date March 11, 1971

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

Subject

~~Instructor's Name~~

Results of complitty exposed 2x2 plates.

1.30	1.27	1.25	1.28	1.30
1.26	1.26	1.23	1.24	1.27
1.22	1.22	1.22	1.22	1.23
1.23	1.23	1.23	1.24	1.25
1.24	1.24	1.25	1.27	1.27

1.17	1.12	1.09	1.10	1.17
1.14	1.10	1.10	1.12	1.14
1.14	1.11	1.08	1.09	1.14
1.13	1.12	1.10	1.12	1.15
1.15	1.13	1.13	1.14	1.16

Exposure times were 1 min each. Using the 30 sec. Timer on the Miller. The ΔD between the two plates was probably caused by a change of voltage in the line.

John + I inserted a solid constant voltage transformer into the 110 volt line. This should take care of any line ~~fluctuation~~ changes in the building and thus give us a constant exposure.

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

STAT

Student's Name

Date March 1, 1971

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

Subject

~~Instructor's Name~~

Test Plates

deform 22 — Exposure Series — Den. — Base Fog

2½ min	1.24-1.28	.05
3 min	1.30-1.38	.05
3½ min.	1.39-1.43	.05
4½ min	1.62-1.67	.05

Density Needed.

1.55 ± .05

A good exposure should be 4 min + 15 sec.

Plate #	Exp Time	Den.		Base Fog.
Dish Developed Together #1	4¼ min	1.48-1.64	✓	.05
Dish Developed Together #2	4¼ min	1.67-1.90		"
Developed Together by Map #3	4¼ min	1.55-1.61	✓	"
Developed Together by Map #4	4¼ "	1.47-1.50	✓	"
Developed Together by Map #5	4¼ "	1.31-1.36-1.16		"
Developed Together by Map #6	4¼ "	1.37-1.45		"
Developed Together by Map #7	4¼ min	1.35-1.48		"
Developed Together by Map #8	"	1.35-1.42		"
Developed Together by Map #9	"	1.14-1.36		"
Developed Together by Map #10				
Dish #11	4¼ min	1.50-1.67	✓	"
Dish #12	"	1.52-1.70	✓	"
Dish #13	"	1.52-1.74	✓	"
Dish #14	"	1.59-1.75		"
Dish #15	"	1.48-1.56	✓	"
Dish #16	"	1.57-1.64	✓	"

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

STAT

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3

Student's Name | Date March 11, 1971

Subject | Instructor's Name

the developed plates have a dip in density in the center of the plate

Approved For Release 2005/11/21 : CIA-RDP78B05171A000500020064-3